

What is claimed is:

1. A communication system, to provide remote access to an operator, suitable for querying and controlling process sections in an industrial plant, the process sections

5 controlled by a centralised computer, the communication system comprising:

a data network;

a plurality of wireless access points on the data network;

a mobile wireless device provided to the operator;

a means for connecting the mobile wireless device to one of the wireless access
10 points; and

an interfacing means for connecting the mobile wireless device with the central
computer using the data network,

whereby the operator equipped with the mobile wireless device is able to query and
control the process sections.

15 2. The communication system as recited in claim 1, wherein the interfacing means
comprises a database containing a profile of each operator.

3. The communication system as recited in claim 1, wherein the interfacing means
20 comprises a means to identify a process section in a vicinity of each wireless access
point.

4. The communication system as recited in claim 1, wherein the mobile wireless device comprises:

an input means for the operator to input query and control instructions for the interfacing means;

5 an output means for providing status information from the central computer to the operator; and

a wireless communication means for communicating with the interfacing means using one of the wireless access points.

10 5. The communication system as recited in claim 4, wherein the input means of the mobile wireless device is a touch screen.

6. The communication system as recited in claim 4, wherein the input means of the mobile wireless device is a keyboard.

15 7. The communication system as recited in claim 4, wherein the output means of the mobile wireless device is a display screen.

8. The communication system as recited in claim 4, wherein the output means of the mobile wireless device provides voice output.

9. The communication system as recited in claim 4, wherein the wireless communication means of the mobile wireless device is a receiver transmitter means.

10. The communication system as recited in claim 1, wherein the interfacing means is hardware.

5 11. The communication system as recited in claim 1, wherein the interfacing means is software.

12. The communication system as recited in claim 1, wherein the mobile wireless device further comprises log-in means enabling the operator to be identified.

13. The communication system as recited in claim 12, wherein the log-in means enables the operator to log-in into either the centralised computer or the mobile wireless device.

14. The communication system as recited in claim 1, wherein the mobile wireless device is provided with a radio frequency means to communicate with the wireless access points.

15. The communication system as recited in claim 14, wherein the mobile wireless device uses IEEE 802.11 wireless protocol.

16. The communication system as recited in claim 14, wherein the mobile wireless device uses HomeRF communication protocol.

17. The communication system as recited in claim 1, wherein the wireless access points use Bluetooth communication protocol, the mobile wireless devices being Bluetooth enabled devices.

5 18. The communication system as recited in claim 17, wherein the mobile wireless device processes voice data.

19. The communication system as recited in claim 1, wherein the mobile wireless device has a storing means to store information from a plurality of the process sections.

10 20. The communication system as recited in claim 1 wherein the mobile wireless device is also a computing device.

15 21. The communication system as recited in claim 1 wherein the mobile wireless device communicates with a selected one of the wireless access points.

22. The communication system as recited in claim 1, wherein the interfacing means uses software objects to represent the process sections.

20 23. The communication system as recited in claim 22, wherein the interfacing means has a list of pre-defined characteristics for each software object.

24. The communication system as recited in claim 22, wherein the interfacing means has the software objects categorized according to a predetermined scheme, and the categories are linked together.

5 25. An industrial control system connected on a data network suitable for an operator to query and control process sections in an industrial plant, the industrial control system comprising of:

a centralised computer to control the process sections over the data network;

a plurality of wireless access points on the data network; and

10 a mobile wireless device that communicates wirelessly with the centralised

computer using one of the wireless access points,

whereby the operator equipped with the mobile wireless device communicates with the centralised computer using the wireless access point to obtain status information about the process sections.

15 26. The industrial control system as recited in claim 25, wherein the centralised computer comprises a database containing a profile of each operator.

20 27. The industrial control system as recited in claim 25, wherein the centralised computer comprises a means to identify a process section in the vicinity of each wireless access point.

28. The industrial control system as recited in claim 25, wherein the mobile wireless device comprises:

an input means for the operator to input query and control instructions for the centralised computer;

5 an output means for providing status information from the centralised computer to the operator; and

a wireless communication means for communicating with the centralised computer using one of the wireless access points.

10 29. The industrial control system as recited in claim 28, wherein the output means of the mobile wireless device is a touch screen.

30. The industrial control system as recited in claim 28, wherein the input means of the mobile wireless device is a keyboard.

15 31. The industrial control system as recited in claim 28, wherein the wireless communication means of the mobile wireless device is a transmitter receiver means.

20 32. The industrial control system as recited in claim 25, wherein the mobile wireless device further comprises log-in means for identifying the operator.

33. The industrial control system as recited in claim 25, wherein the mobile wireless device is provided with a radio frequency means to communicate with the wireless access points.

5 34. The industrial control system as recited in claim 33, wherein the mobile wireless device uses IEEE 802.11 wireless protocol.

35. The industrial control system as recited in claim 33, wherein the mobile wireless device uses HomeRF communication protocol.

10 36. The industrial control system as recited in claim 25, wherein the wireless access points use Bluetooth communication protocol, the mobile wireless devices being Bluetooth enabled devices.

15 37. The industrial control system as recited in claim 36, wherein the mobile wireless device processes voice data.

38. The industrial control system as recited in claim 25, wherein the centralised computer uses software objects to represent the process sections.

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39. The industrial control system as recited in claim 38, wherein the centralised computer has a list of pre-defined characteristics for each software object.

40. The industrial control system as recited in claim 38, wherein the centralised computer has the software objects categorized according to a predetermined scheme, and the categories are linked together.

5 41. The industrial control system as recited in claim 25, wherein the mobile wireless device has a storing means to store information from a plurality of the process sections.

42. The industrial control system as recited in claim 25, wherein the mobile wireless device is a computing device that analyses the status information.

43. The industrial control system as recited in claim 25 wherein the mobile wireless device communicates with a selected one of the wireless access points.

44. A method for an operator to remotely query and control process sections in an industrial plant using a mobile wireless device, the process sections being controlled by a centralised computer over a data network, the data network including a plurality of wireless access points, the mobile wireless device exchanging information with the centralised computer, the information including data related to process sections and query and control instructions, the method comprising the steps of:

20 establishing a communication link between the mobile wireless device and the centralised computer using one of the wireless access points;
 processing of information to be sent to the mobile wireless device by the centralised computer; and

exchanging information between the operator and the centralised computer using the established communication link.

45. The method for an operator to remotely query and control process sections in an industrial plant using a mobile wireless device as recited in claim 44 wherein the establishing step further comprising the steps of:

approaching a wireless access point with the mobile wireless device;
transmitting a request signal from the mobile wireless device to the centralised computer in response to approaching the wireless access point;
acknowledging, by centralised computer, the transmitted request signal; and
identifying the location of the mobile wireless device using a known location of the approached wireless access point.

46. The method for an operator to remotely query and control process sections in an industrial plant using a mobile wireless device as recited in claim 44 wherein the establishing step further comprises the steps of:

detecting the mobile wireless device carried by the operator by searching amongst a plurality of mobile wireless devices; and
identifying a location of the operator using a known location of a selected one of the wireless access points which is wirelessly connected to the mobile wireless device of the operator.

47. The method for an operator to remotely query and control process sections in an industrial plant using a mobile wireless device as recited in claim 44 wherein the step of processing the information further comprises the steps:

identifying the operator;

5 identifying a location of the mobile wireless device;

identifying a selected one of the process sections near the mobile wireless device;

customizing the information from the identified process section based on an

identification of the operator; and

presenting the customized information to the operator.

10 48. The method for an operator to remotely query and control process sections in an industrial plant using a mobile wireless device as recited in claim 44 wherein the step of establishing a communication link between the wireless device and the centralised computer uses a Radio Frequency link.

15 49. The method for an operator to remotely query and control process sections in an industrial plant using a mobile wireless device as recited in claim 44 wherein the step of establishing a communication link between the wireless device and centralised computer uses a Bluetooth access point.

20 50. A computer program product for enabling exchange of information between a mobile wireless device and a centralised computer, the centralised computer querying and controlling a plurality of process sections in an industrial plant, the centralised computer

processing the information, the information including data related to process sections and query and control instructions, the computer program product embodied on one or more computer readable media and comprising:

computer readable program code means for establishing a communication link

5 between the mobile wireless device and the centralised computer using a wireless access point located in a vicinity of the process section;

computer readable program code means for processing of the information to be sent to the mobile wireless device; and

computer readable program code means for enabling the exchange of information
10 between the operator and the centralised computer.

51. The computer program product as recited in claim 50, wherein the computer readable program code means for establishing a communication link further comprises:

15 computer readable program code means for enabling an operator to log-in to the central control system via the mobile wireless device to enable identification of the operator.

52. The computer program product as recited in claim 50, wherein the computer readable program code means for establishing a communication link further comprises:

20 computer readable program code means for identifying a location of the operator.

53. The computer program product as recited in claim 50, wherein the computer readable program code means for establishing a communication link further comprises:

computer readable program code means for searching for the operator amongst a plurality of mobile wireless devices; and

computer readable program code means for identifying a location of the operator using a known location of the wireless access point wirelessly connected to

5 searched operator.

54. The computer program product as recited in claim 50, wherein the computer readable program code means for establishing a communication link further comprises:

computer readable program code means for identifying the operator;

10 computer readable program code means for identifying a location of the mobile wireless device;

computer readable program code means for identifying a selected one of process sections in a vicinity of the mobile wireless device; and

15 computer readable program code means for customising the information from the identified process section based on identification of the operator.

55. A computer program product for representing process sections in an industrial plant, the computer program product embodied on one or more computer readable media and comprising:

20 computer readable program code means for enabling representation of process sections as software objects;

computer readable program code means for enabling representation of characteristics of process sections as attributes of the software objects; and

computer readable program code means for enabling representation of an industrial plant as a hierarchy of software objects.

56. A computer program product in a computer readable medium comprising:

5 computer readable program code means for representing a profile of an operator who remotely queries and controls process sections in an industrial plant; and computer readable program code means for customising information about a process section dependent on the profile of a operator.

10 57. A computer program product for querying and controlling process sections in an industrial plant, the process sections controlled by

an industrial control system, comprising computer program code elements and software code portions, wherein

15 the computer program product when run on a computer causes the computer to use a communication link established between a mobile wireless device and a centralised computer of the industrial plant,

exchange process information between the mobile wireless device and the centralised computer, and

20 provide an input means and output means for information exchange between an operator and the centralised computer.